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AUTO.POINT TT-7120-120

USER MANUAL

Version V3.1

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Contents

Performance	2
Operation.....	4
Transmission Site	4
Unpacking.....	5
Set up the antenna	5
M&C Terminal Setup & Operating.....	8
Manual pointing	13
Stow AUTO.POINT SYSTEM	13
Stowing reflector segments	14
Front panel layout.....	16
Manual Procedures	17
Manual polarization control.....	17
Manual Stowing	18
BUC Installation.....	19
How to Make a BUC Connector (Wavestream 16W~40W) .	22
Chance LNB.....	24

Performance

The AUTO.POINT SYSTEM Satellite antenna system is specially designed for high data transmission rate. A state-of-art carbon fiber antenna dish, compacted chassis allows the quality of being light enough to be carried. The three axis (AZ, EL, and POL) servo system promises full auto field deployment. One-button control design to easy one-man operation and precludes the requirement for professional personnel or ancillary equipment. A PC-based GUI or an optional PDA can be used for more in-depth configuration over wire or wireless means. A critical Gregorian dual offset elliptical antenna and feed system innovative technology achieves high gain, low side lobes, excellent cross-pol isolation and high Tx/Rx isolation. The product complies with military standards and rigorously tested under the toughest environmental conditions.

Model		TT-7120-120
Type		Gregorian Dual-reflector Antenna
Dish Material		Carbon Fiber
Aperture		1.2×1.1 m
Frequency	Rx	10.95 ~ 12.75GHz
	Tx	13.75 ~ 14.5GHz
Gain	Rx	41dBi
	Tx	42dBi
Side Lobe Performance		29—25logθ dBi
G/T		19.5 dB/K (20° Elevation)
V.S.W.R	Rx	≤1.25:1 LNB input
	Tx	≤1.25:1 OMT input
Tx/Rx Isolation		≥85dB
Polarization Isolation		≥35dB (On axis)
Polarization		Linear, Tx/Rx
Feed Interface		WR75
Operating Mode		Key Touch Positioning
Tracking Accuracy		≤0.2°
Setup Time		≤3min
M&C		Graphical Desktop Terminal WebServer (optional)
M&C Interface		Wire (10/100 Ethernet) Wireless (802.11b, 802.11g)
Azimuth		±90°, step0.1°
Elevation		10°~ 90°, step0.1°
Polarization		±90°, step0.1°
Net Weight		25KG
Packing		ABS+Soft Suitcase
Suitcase 1 Size		802×520×316mm
Suitcase 1 Weight (with antenna)		37KG
Suitcase 2 Size		732×510×185mm
Suitcase 2 Weight (with Petals)		9.63KG
Power Supply		90–264 VAC, 47–63 Hz 48VDC (optional)
Power Consumption		Maximum 110W (without BUC)

Operating Temperature	-30°C ~ +55°C
Storage Temperature	-40°C ~ +80°C
Operational Winds	Operational Winds: ≤12m/s Survival Winds: ≤18m/s (reinforced)
Rain Proof	≤100mm/h
Operational Humidity	0% ~ 100%
Altitude	4000m

Operation

For successful operation, plan all mission activities from preparative collection for data to stowing the system and restoring the transmission site.

Transmission Site

Before setting up the terminal, it is important to choose a suitable site for the operation. The checklist below gives some important aspects to consider.

Check it:

- The environmental conditions are suitable for your system
- The line of sight towards the satellite and the exclusion zone are free from obstacles. A handheld inclination meter and a compass are useful.
- The line of sight is the straight path (according to pointing solution) between the antenna and the satellite.

Transmission Site Obstacle-free Zones	
Object type	Exclusion Zone
Reflective Surfaces(metals)	Within ±5° of boresight
People, animals	Within ±20° of boresight Within the Radiation Hazard Zone
Objects, vegetation	Within ±5° of boresight

- 5° is approximately the size of an adult hand span, held at arm's length;
- 1° is approximately the size of an adult thumb, held at arm's length.

You have a stable flat surface for the system to stand on. You need room for a working area outside the radiation hazard zone.

You also need to:

Prevent unauthorized access to the equipment. If your system will transmit – clearly mark the microwave radiation hazard zone for the antenna. Access to the zone should be limited to deploying and stowing the system.

Unpacking

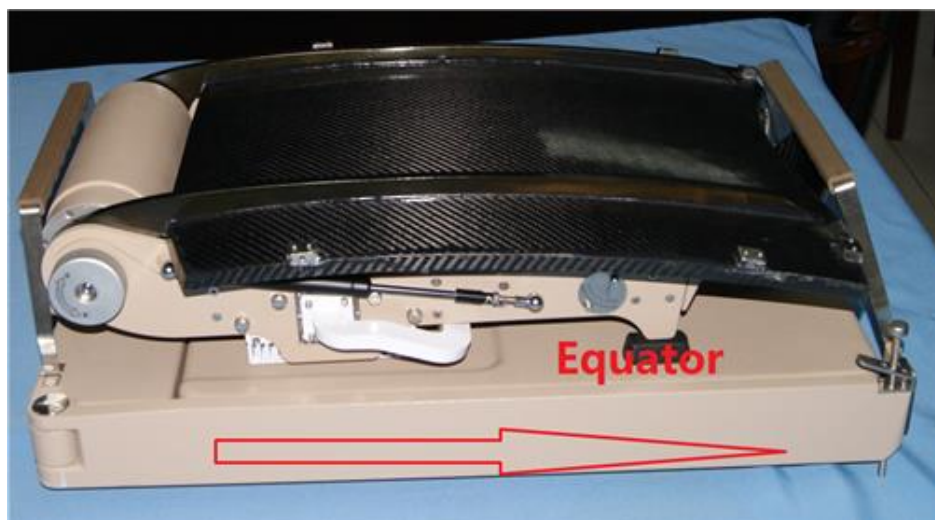
- On arrival at the transmission site you should:
- Inspect the cases for transportation damages before opening.
- Open the cases and inspect the contents for damages.
- Remove the equipment from the transportation cases:
- Lift the AUTO.POINT System by its front handle. When possible, two persons should make the lift.



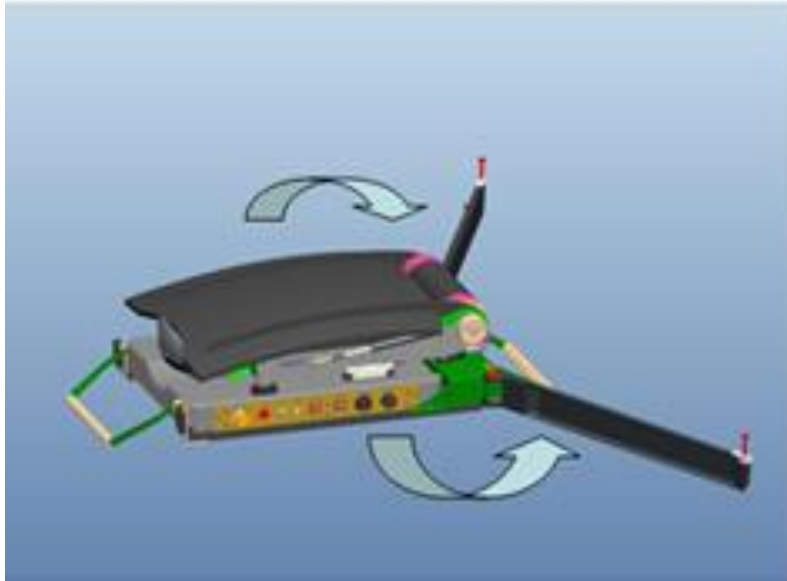
- Place the AUTO.POINT System on a flat, stable surface.

Set up the antenna

- Align AUTO.POINT System in the direction of the satellite or towards the equator.
Use the compass to go with the antenna

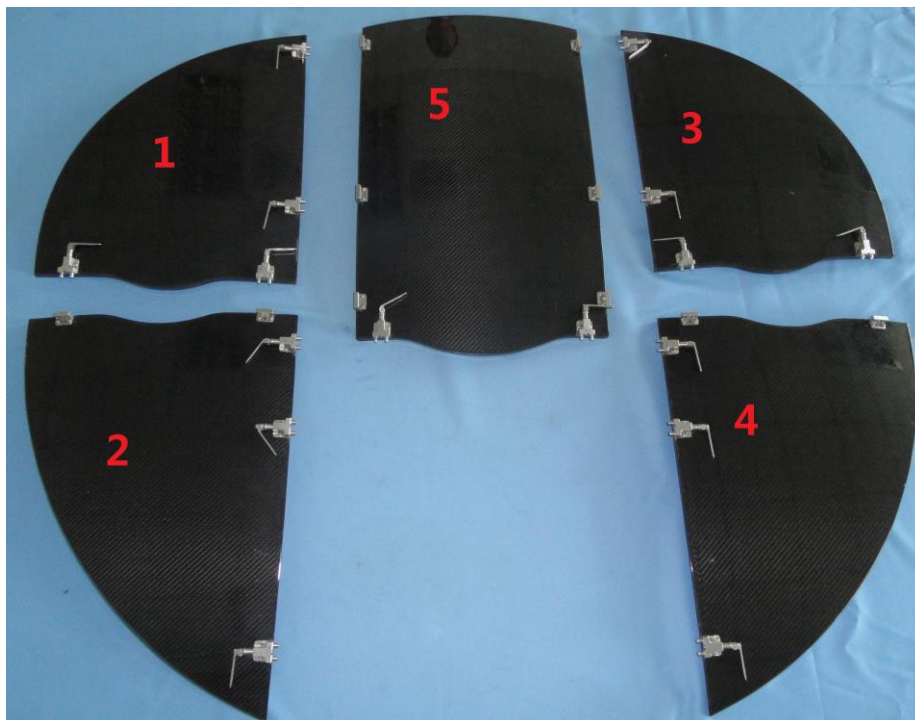


- Fold out the support legs on the AUTO.POINT System

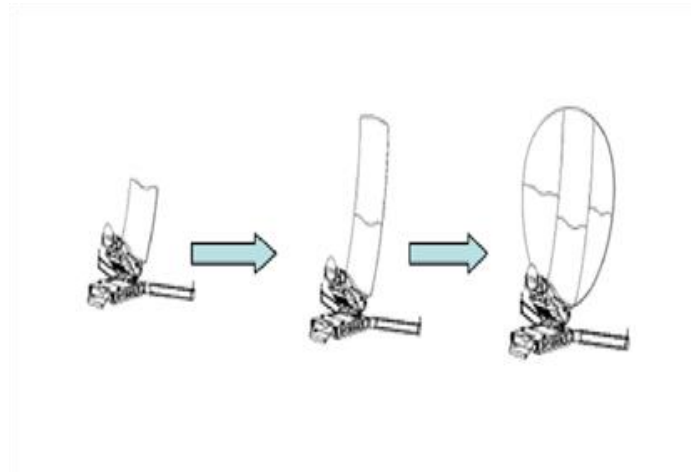
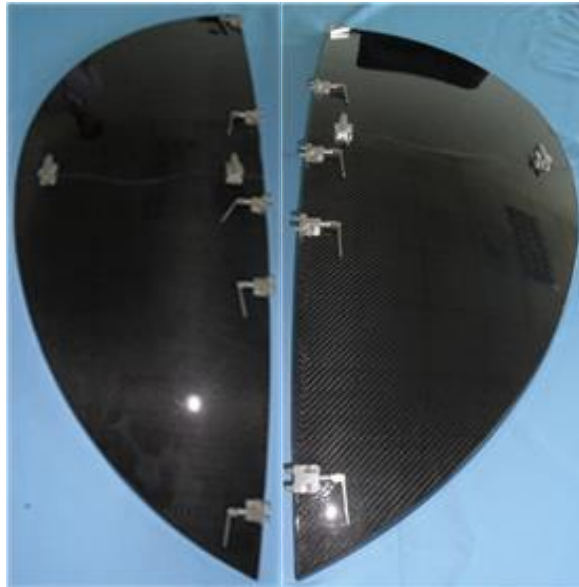


Ensure that AUTO.POINT SYSTEM stays firmly on the ground and that it cannot move during operation.

- Check that the power outlet is protected by cap and that the power cables are in good condition.
- Ensure that the AUTO.POINT SYSTEM is clean.
- Connect the AUTO.POINT SYSTEM to an external power source.
- Allow the AUTO.POINT SYSTEM time to power up and warm up. It will take about 60 seconds, when warm up is ready, press 'Q-TOUCH'
- Mounting the Main Reflector Segments
- When AUTO.POINT SYSTEM motor stop moving after power up, Pick up the reflector segments from the transport case and mount them in order below.



- Lock 1,2 together , and then lock 3,4 together



and lock as shown below. Ensure that the lock shaft engages in the opposite part of the lock.



Reflector segments are specific for each antenna and must not be inter-changed. Each segment is marked with the antenna serial number. If a segment is broken the whole antenna must be replaced. Using the wrong antenna segments will seriously affect the antenna performance and may damage the main reflector

M&C Terminal Setup & Operating

AUTO.POINT SYSTEM comes equipped with "One Button Control System"; it is fully automated and can be controlled by one button "Q-TOUCH" presented on the interface panel, except change the parameters of satellite, etc.

AUTO.POINT SYSTEM can be configured, monitored and controlled by M&C terminals with friendly GUI interface also. Cable connection for PC, and Wi-Fi connection for PC M&C, setup as following:

1. Connect laptops to the antenna at "MONITOR" port using the supplied Ethernet RJ-45 cables.
2. Open your "LAN Connection Properties", select "Internet Protocol (TCP/IP)"
"and click on "Properties"

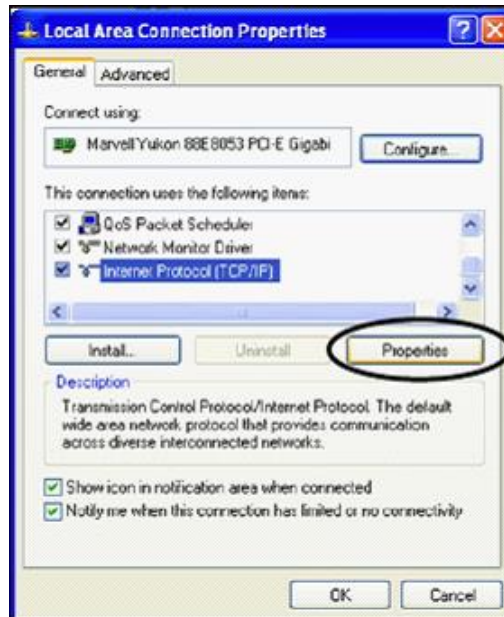


Figure 5: Local Area Connection Properties

3. Select "Use the following IP address:" and type in an address that is in the same network segment with the antenna, the subnet mask should fill in automatically (if not, 255.255.255.0 will suffice).



Figure 6: Use the following IP address

4. Click "ok", finish the setup, and connect to the antenna

5. Double click "M&C.exe" in the M&C file folder where copied to,
6. Login as "akdadmin", no password(leave it blank will be ok), IP address is the same as the antenna,

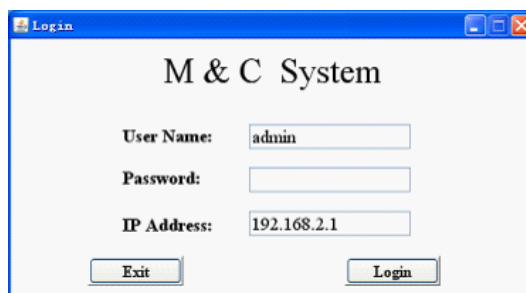


Figure 7: Log on to M&C System

7. Then click "login", the pop-up shows the status of all the sensors.



Figure 8: Self-Checking Window

8. About 10 seconds self-checking, the main M&C windows comes up, and the antenna is now operational

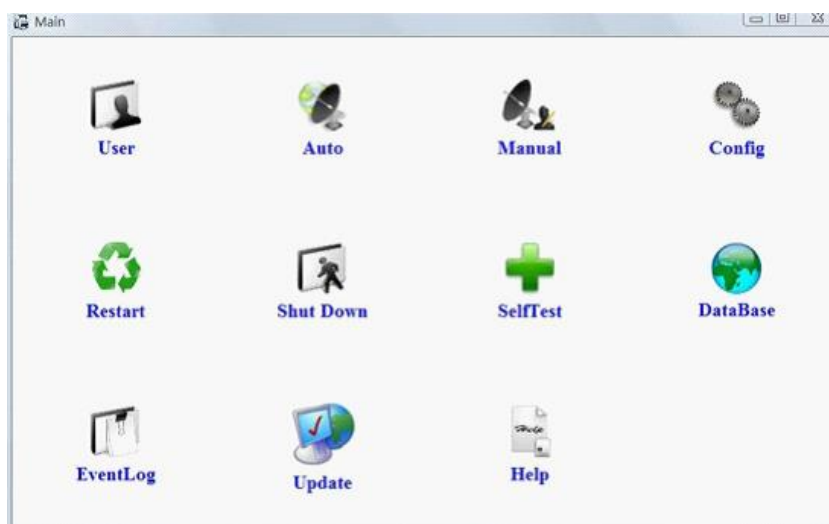
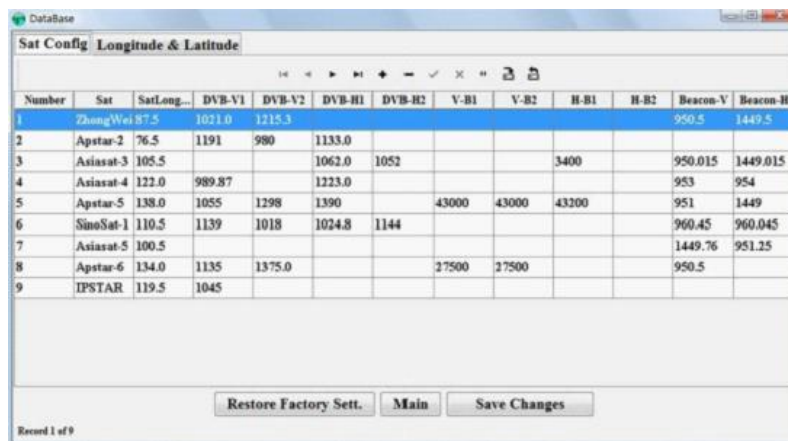


Figure 9: Main M&C Window

9. You can monitor and control antenna by this "Main" window. There are eleven icons present related functions, description briefly below:

- User for Account management
- Auto for Auto-acquire control
- Manual for Manual control
- Config Configuration of database and status of antenna and sat
- Restart To restart auto-acquire system
- ShutDown For the system shut down and stowing
- SelfTest Antenna healthy status self-checking
- DataBase For database configuration of antenna and satellite
- EventLog It is a Log file recoding all events occurred
- Update Open in the future
- Help Open in the future

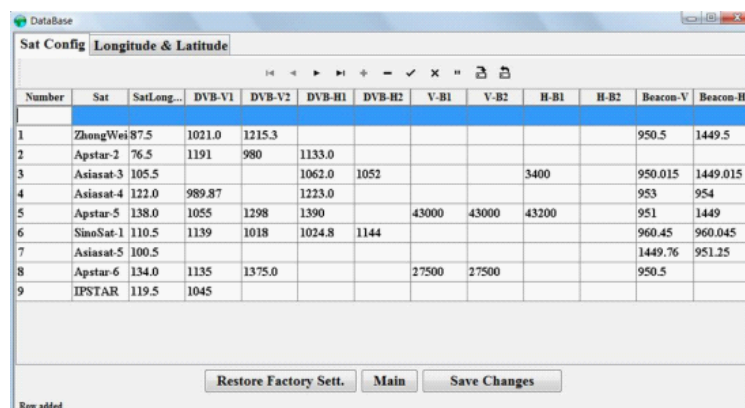
10. Click on "DataBase", checking if your satellite is in the list.



Number	Sat	SatLong...	DVB-V1	DVB-V2	DVB-H1	DVB-H2	V-B1	V-B2	H-B1	H-B2	Beacon-V	Beacon-H
1	ZhongWei	87.5	1021.0	1215.3							950.5	1449.5
2	Apstar-2	76.5	1191	980	1133.0							
3	Asiasat-3	105.5			1062.0	1052			3400		950.015	1449.015
4	Asiasat-4	122.0	989.87		1223.0						953	954
5	Apstar-5	138.0	1055	1298	1390		43000	43000	43200		951	1449
6	SinoSat-1	110.5	1139	1018	1024.8	1144					960.45	960.045
7	Asiasat-5	100.5									1449.76	951.25
8	Apstar-6	134.0	1135	1375.0			27500	27500			950.5	
9	IPSTAR	119.5	1045									

Figure 10: Satellite Parameters Configuration DataBase Window

If not, click "+" then add it. Type in satellite name in "sat", satellite longitude in "satlongitude"(only digits, no directions, directions must be closed in the "config' page.), vertical polarization beacon frequency in "Beacon-V", horizontal polarization beacon frequency in "Beacon-H".



Number	Sat	SatLong...	DVB-V1	DVB-V2	DVB-H1	DVB-H2	V-B1	V-B2	H-B1	H-B2	Beacon-V	Beacon-H
1	ZhongWei	87.5	1021.0	1215.3							950.5	1449.5
2	Apstar-2	76.5	1191	980	1133.0							
3	Asiasat-3	105.5			1062.0	1052			3400		950.015	1449.015
4	Asiasat-4	122.0	989.87		1223.0						953	954
5	Apstar-5	138.0	1055	1298	1390		43000	43000	43200		951	1449
6	SinoSat-1	110.5	1139	1018	1024.8	1144					960.45	960.045
7	Asiasat-5	100.5									1449.76	951.25
8	Apstar-6	134.0	1135	1375.0			27500	27500			950.5	
9	IPSTAR	119.5	1045									

Figure 11: Adding Satellite into DataBase

Make sure click on "Save Changes" after input parameters, and click on "Main", DataBase" window closed, and back to "Main" window.

11. Click on "Config" on the "Main" window, select the target satellite which you want to use with proper tracking parameters (the direction (East or West) of the satellite longitude must be selected manually). If the satellite is not on a inclined orbit, go to step 13,

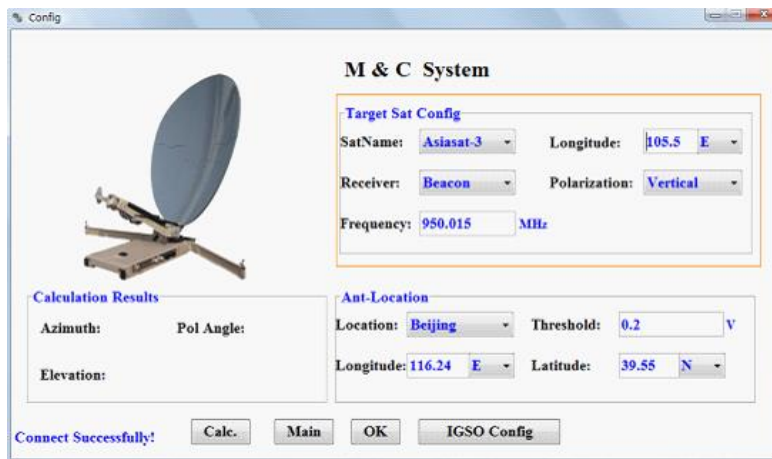


Figure 12: Configuration Window

12. If the GPS does not work properly, you can select the antenna location in "Ant-Location" area, if it is in the list. If not, you can choose "Select Pls. ...", and input the Longitude (chose "E" East, and "W" for West) and Latitude (chose "N" for North, and "S" for South) of antenna.

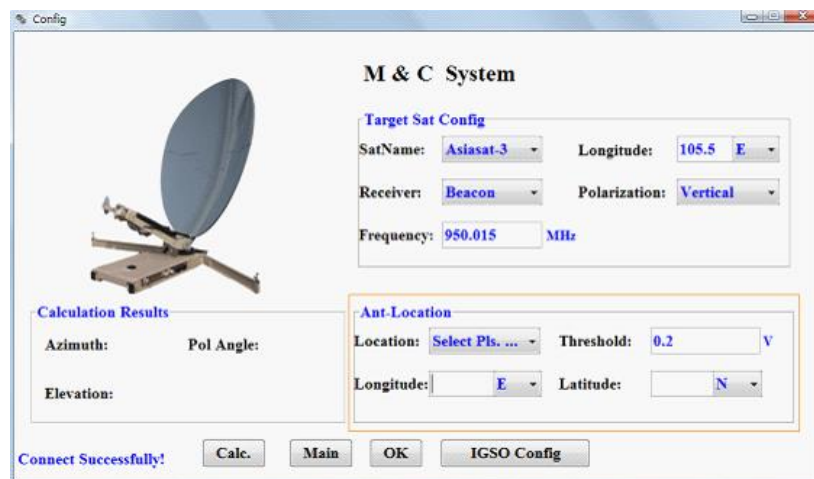


Figure 15: Antenna Location in Configuration Window

13. And also you can calculate the theoretical tracking parameters of the satellite when you click "Calc.".

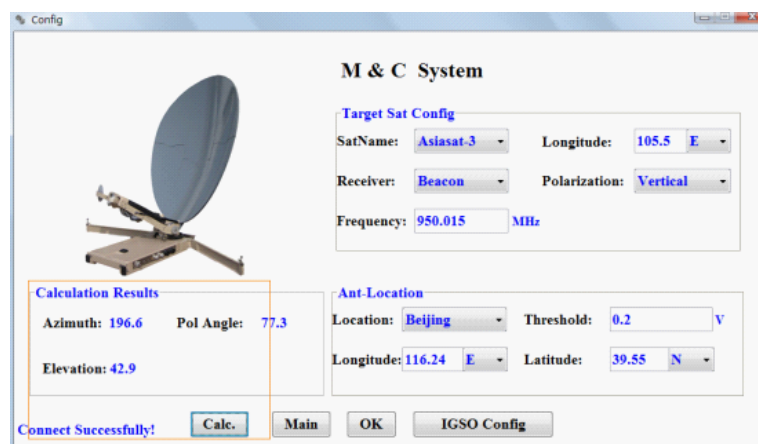


Figure 16: Calculation in Configuration Window

14. Then click "OK", the auto pointing process will begin, it takes approximately 3 minutes. The "Q-TOUCH" light on the interface panel turns green indicating satellite acquisition. The window changes to "Auto"



Figure 17: Status in Auto Window-- Searching

When lock the satellite the status turns to red.

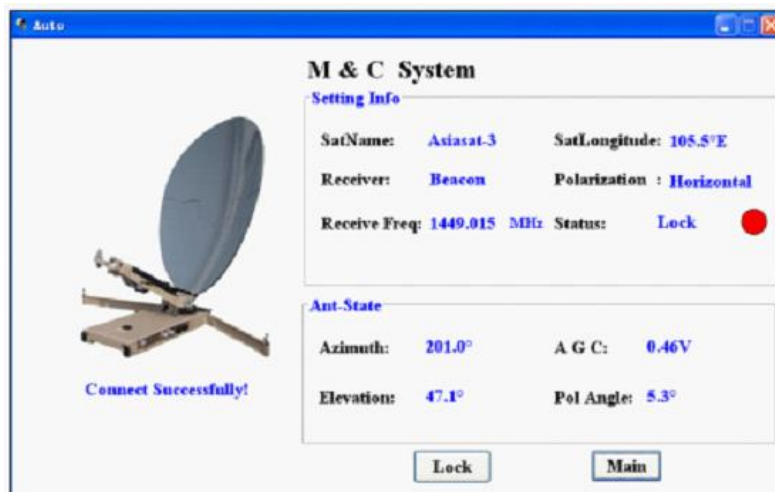


Figure 18: Status in Auto Window-- Lock

And the "Q-TOUCH" button light turns blue in the same time.

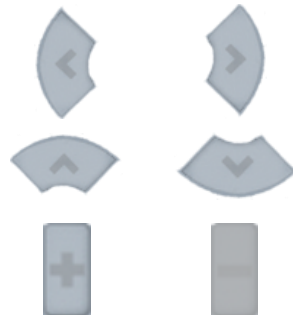
Before transmission, the "HPA " switch must be push down to power up the SSPA, then you can use your modem to control transmission and reception, follow the instructions provided by the service provider.

You can use the others functions of M&C by click the related icon to monitor and control the antenna

Manual pointing

To point the antenna manually, use the navigation keypad inset in the Point Antenna view.

To point the antenna manually, use the navigation keypad inset in the 'manual' view.



is for azimuth movement

is for elevation movement

is for polarization movement

Clicking a key moves the antenna one step, and the step size can be configured

Holding down a key moves the antenna with a continuous speed.

Stow AUTO.POINT SYSTEM

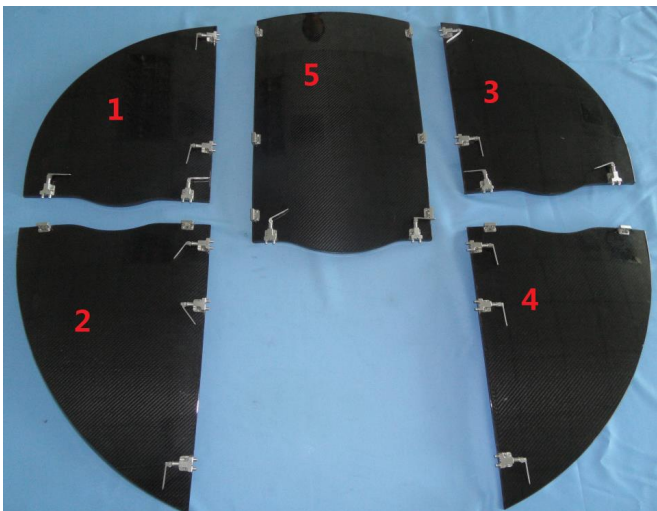
1. When the service is done, push the "HPA " to its release position, its red light turns off, the BUC's power
2. disabled, and transmission terminated.
3. Press and hold "Q-TOUCH" button for 3 seconds, its green light blinking, starting the shutdown progress, and antenna moving to stowing position,
4. When antenna is stopped; and then disassemble the reflector segments, Detach the reflector segments from the main reflector in order 1, 2, and 3 and stow them in the transport case.
5. Press "Q-TOUCH" button to resume the stowing progress, the antenna will stow properly. the base segment of reflector comes to initial position,
6. Disconnect all cables and packaging them
7. Put back all sockets weatherproof caps, and close support legs. The antenna comes back to initial condition
8. Clean everything, and put them into the case.

Stowing reflector segments

1. Unzip the soft case for the reflector segment.



and we number the segments and following



2. Insert the reflector segment 3 into the bottom layer.



3. Insert the reflector segment 1 into the fourth layer.



3. Insert the reflector segment 4 in third layer .



4. Insert the right reflector segment 4 into the second layer .

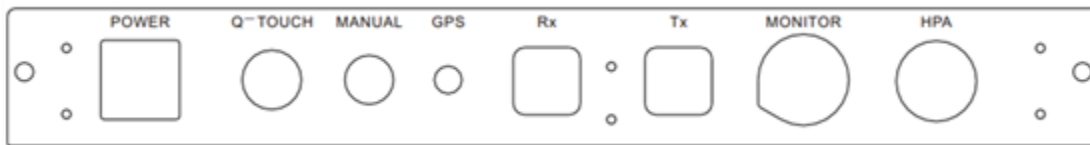


5. Insert the reflector segment 5 into the top layer



Ensure that the reflector surface is towards the cover.

Front panel layout

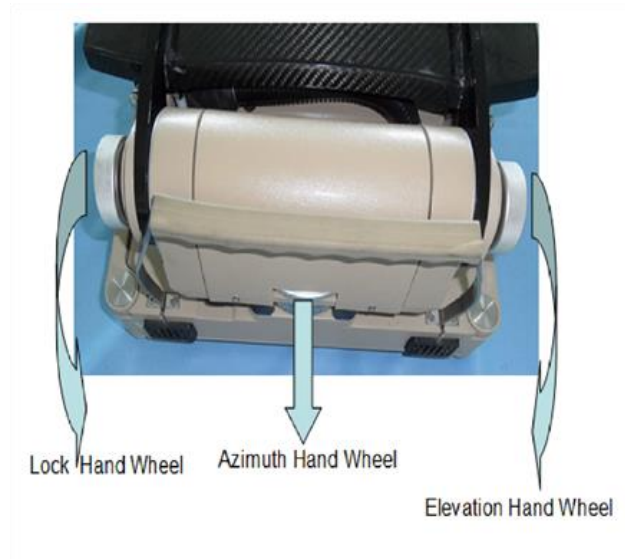


The interface panel illustrated as above, and there are:

- 1-POWER AC Power socket, AOPULO AF20 weatherproof
- 2-Q-TOUCH It is "One button control" multifunction button.
- 3-MANUAL Push to switch between auto and manual condition
- 4-GPS SMA Female, for GPS antenna connection
- 5-Rx N-type female, for IF reception connection
- 6-Tx N-type female, for IF transmission connection
- 7-MONITOR RJ45, waterproof UBIDE-CEZ, to M&C PC
- 8-HPA Switch for BUC power enable/disable

Manual Procedures

In case of motor failure, AUTO.POINT SYSTEM can be operated and stowed manually. Manual hand wheel controls for elevation and azimuth are easily reached from behind the reflector system.

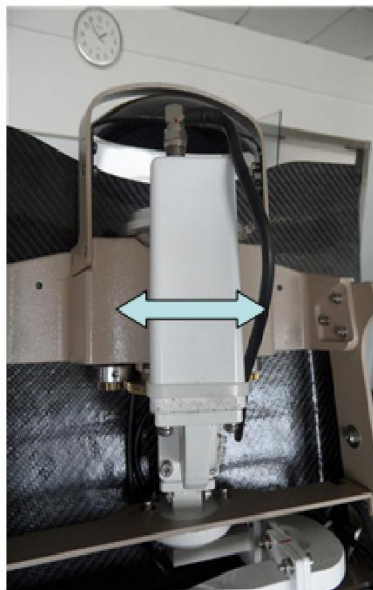


Manual hand wheel controls are used to position the antenna in case of a motor failure. The default position of the locking nuts is unlocking position. When the antenna is correctly positioned with manual override, the respective locking nut shall be turned to locking position.

When repositioning the antenna, unlock the hand wheel control before positioning. Lock again after the correct position is reached.

Manual polarization control

To move the polarization, take a firm grip of the feed horn and slowly turn the feed system. This will not work if the motor has jammed, in which case you need a trained service engineer to release the polarization drive gear.

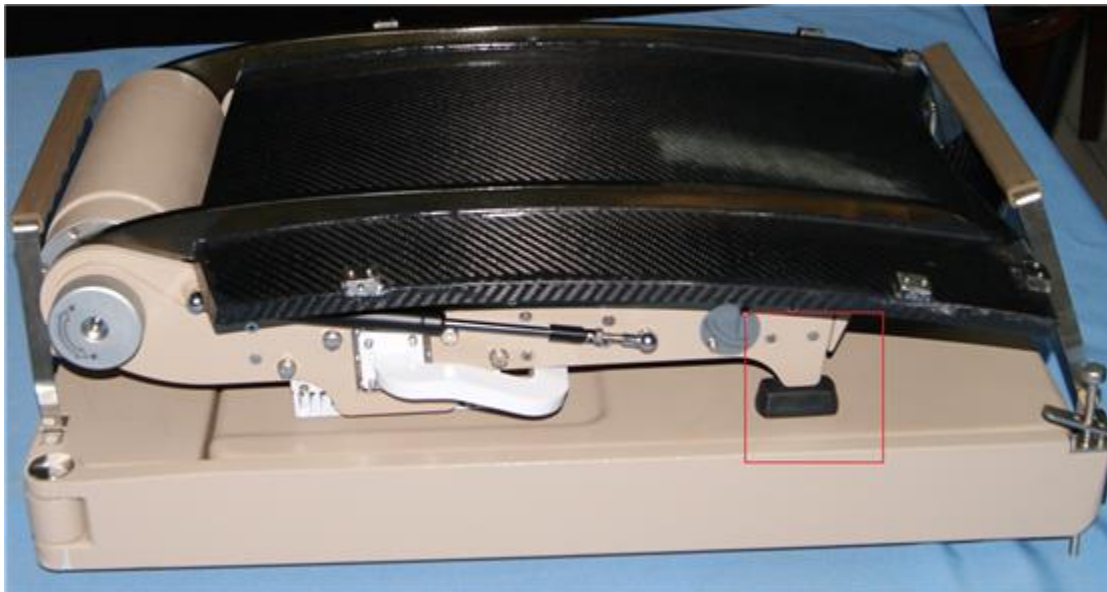


Manual Stowing

- Power failure or mechanical damage may force you to stow manually.
- Disconnect equipment and stow reflector segments as described above.
- Turn the feed system to its home position holding the feed horn. The picture below shows the approximate home position to reach.



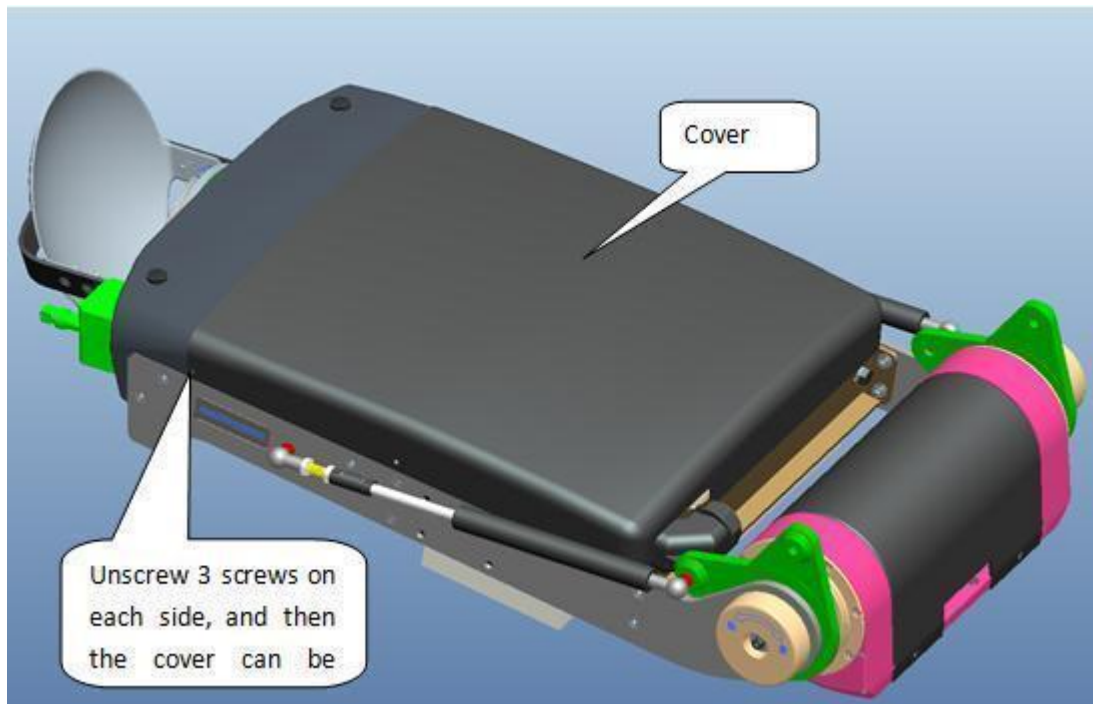
- Gently turn the reflector system counterclockwise to stow position.
- Carefully lower the feed arm and check that the guide pin on top of AUTO.POINT SYSTEM fits into the slit in the bottom of the feed arm.



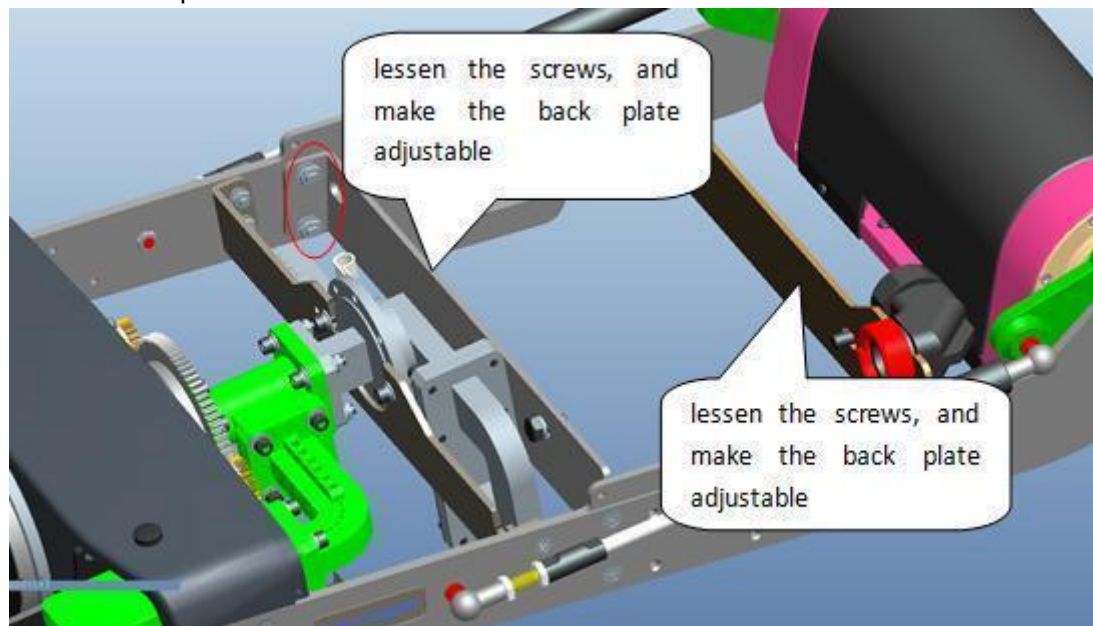
- Fold down the main reflector over the AUTO.POINT SYSTEM chassis cover.

BUC Installation

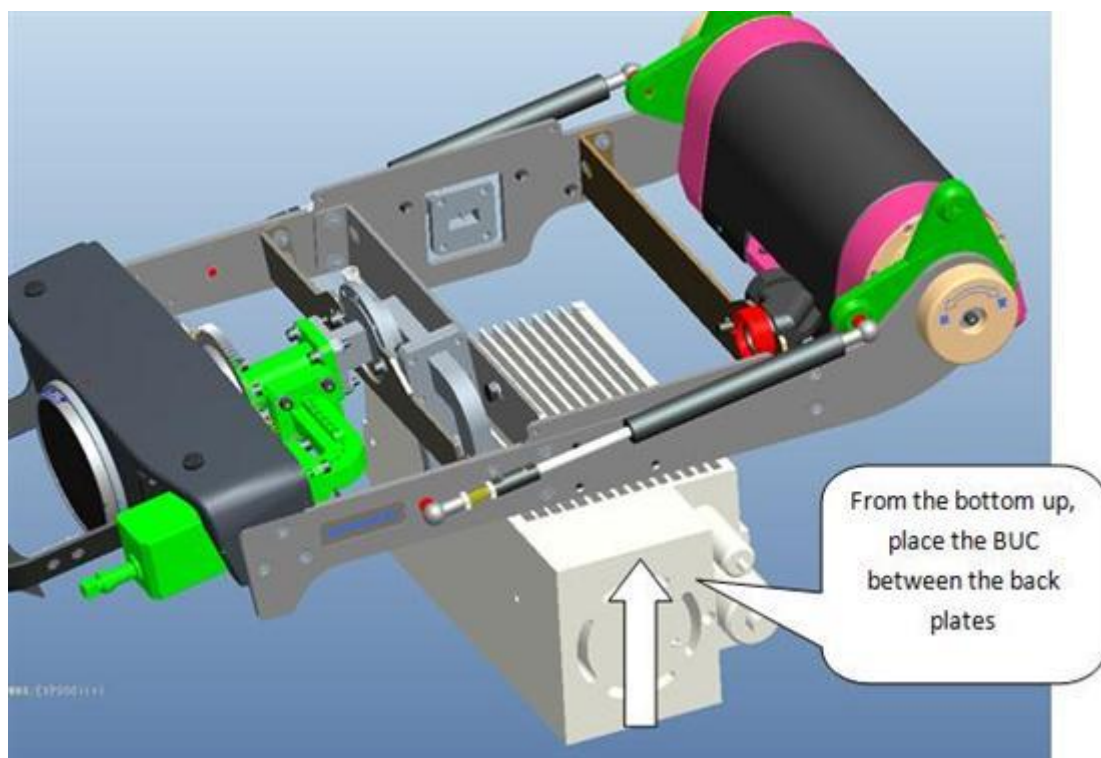
- Uncover the feed unit



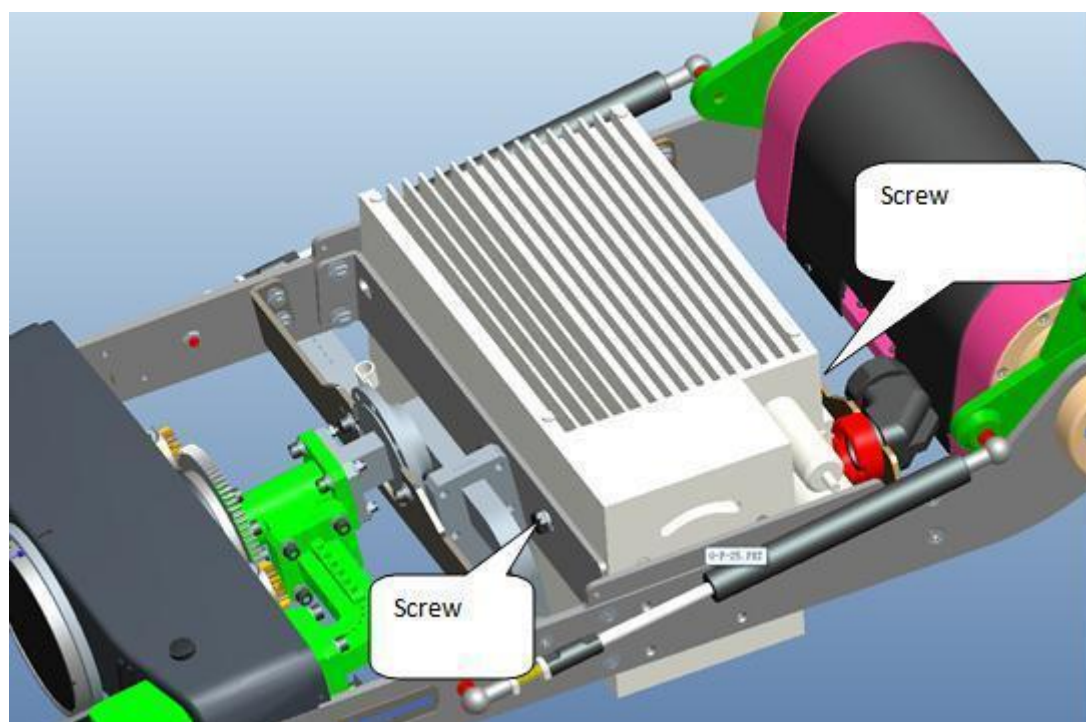
- Loosen the back plate

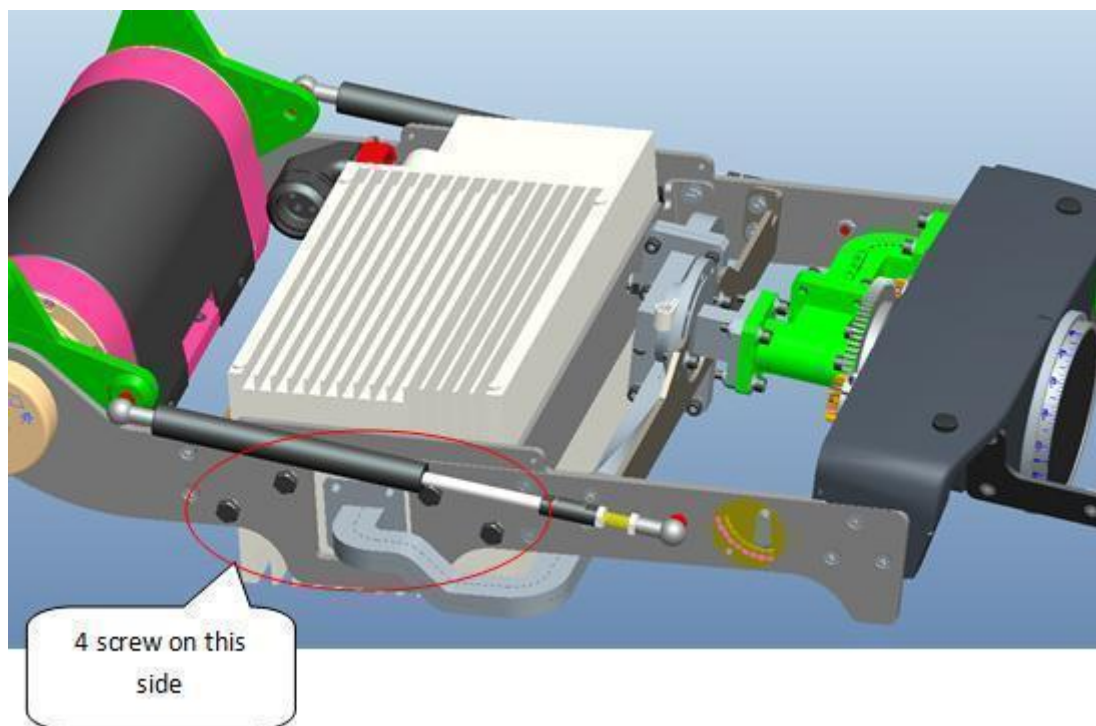


- Install BUC

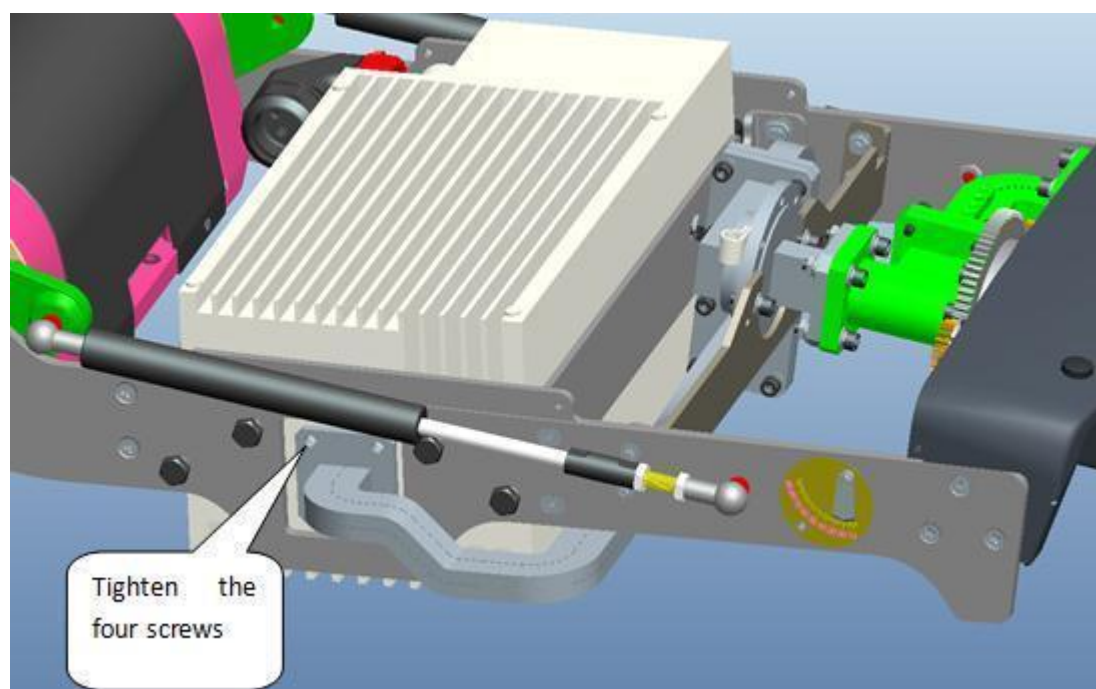


- Tighten the screws





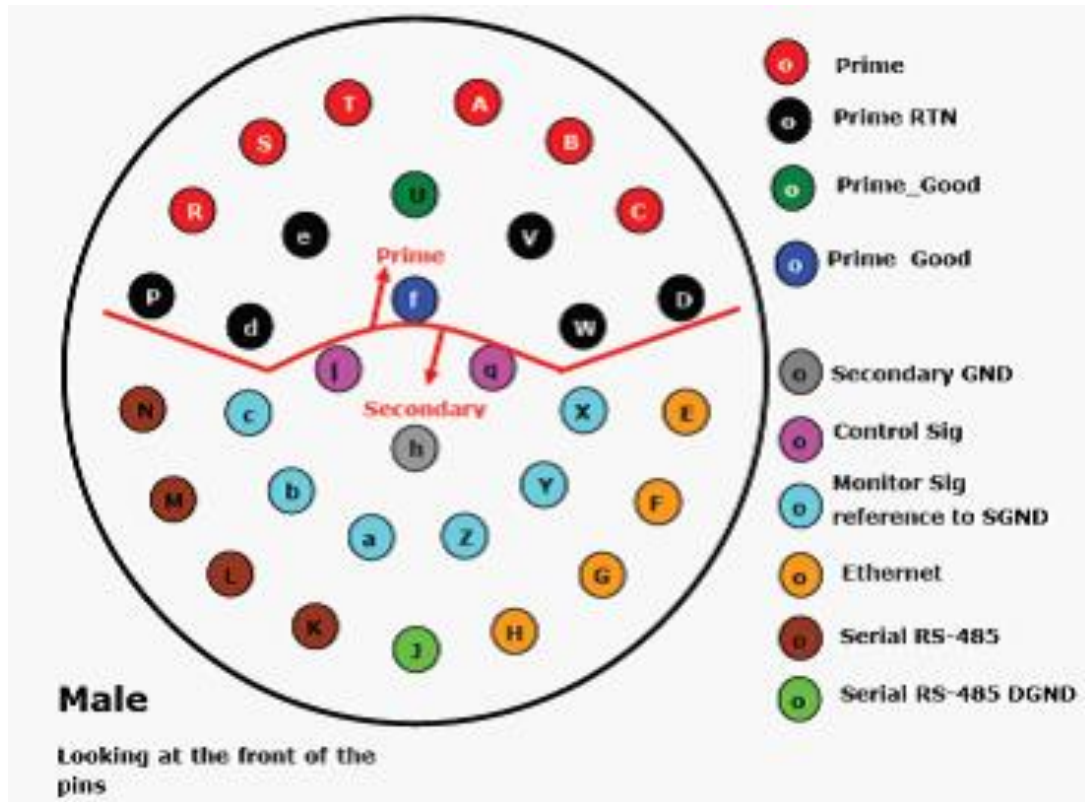
- Install waveguide



- connect IF, and power cable, cover the feed finish the installation

How to Make a BUC Connector (Wavestream 16W~40W)

- Bayonet-style Circular Connector.



+48V: R、S、T、A、B、C



GND: P、d、e、V、W、D



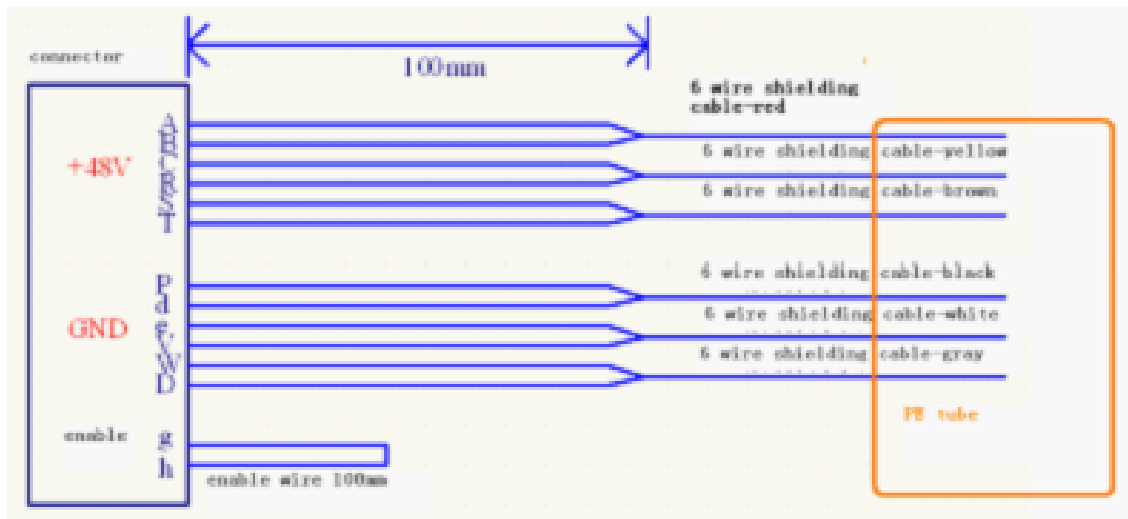
Tx enable: g



Secondary GND: h

- Wire length
 - +48V: R、S、T、A、B、C: 100mm
 - GND: P、d、e、V、W、D: 100mm
 - Tx enable: short connect g and h: 100mm
- technological requirements
 1. Seal the 6-line cable with a diameter 10mm and length 130mm heat shrinkable tubing
 2. Properly weld all the lines to the connector, and each line should be protected with the heat shrinkable tubing

4. After the welding process has done properly, pull the diameter 10mm heat shrinkable tubing to the right position to seal the cable.
5. Use blow-drier to shrink all the heat shrinkable tubing properly

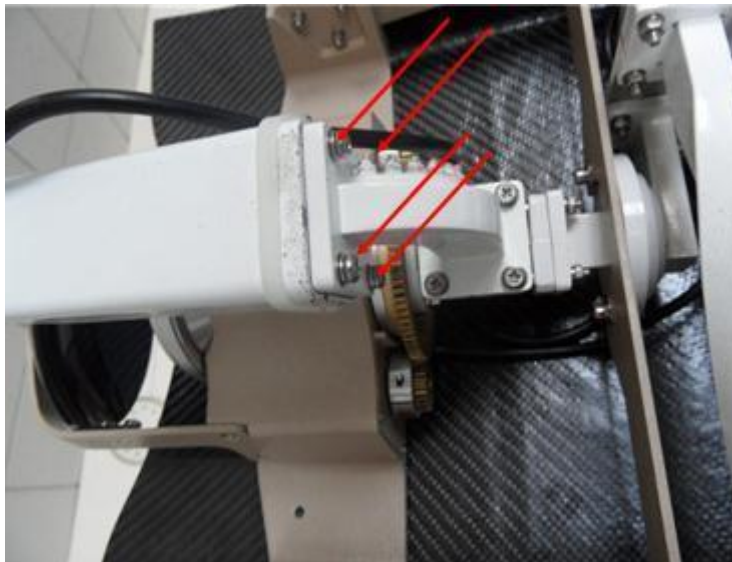


Change LNB

- Find a clean working environment that will not pollute the RF components.
- Make sure all power is switched off and that the Power Supply is disconnected.
- Rotate the LNB manually to an upright position(turn the feed horn).
- disconnect the LNB cable from the top F-type connector



- Unscrew the 4 screws holding the LNB and remove it.



- Mount the new LNB with the interface of the waveguide pair correctly. Ensure that the O-ring is still on the LNB.
- connect the LNB cable to the F-type connector.
- Rotate the LNB to its stow position.